Central Valley Project Improvement Act

Draft Programmatic Environmental Impact Statement

Executive Summary

US Department of the Interior
Bureau of Reclamation
Sacramento, California

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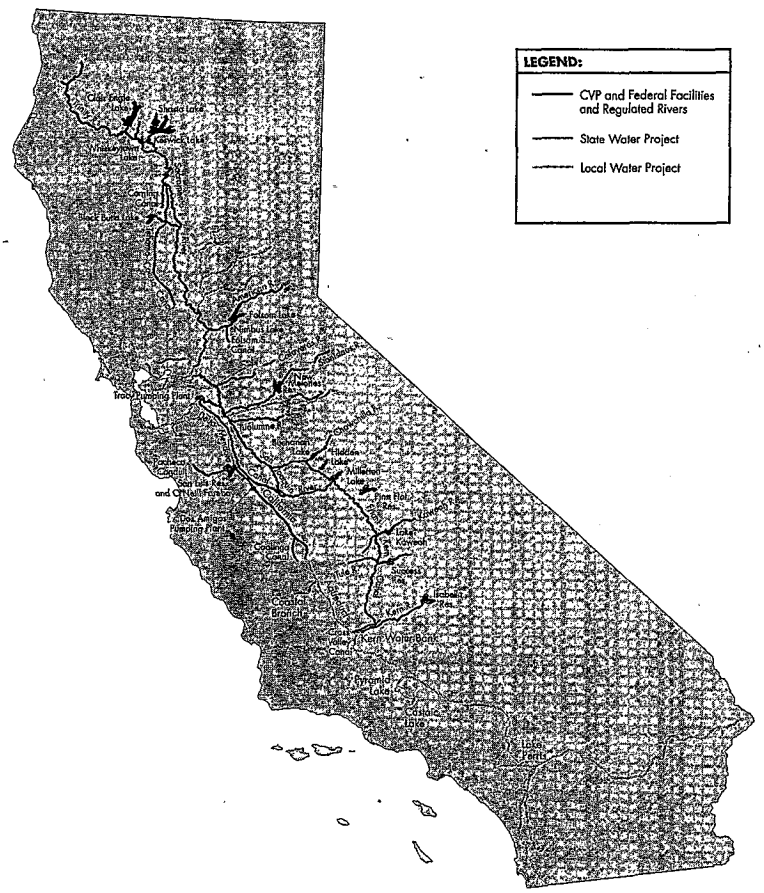
Contents

EXECUTIVE SUMMARY

Introduction

On October 30, 1992, the President signed into law the Reclamation Projects Authorization and Adjustment Act of 1992 (Public Law 102-575), which included Title XXXIV, the Central Valley Project Improvement Act (CVPIA). The CVPIA amends the previous authorizations of the California Central Valley Project (CVP) to include fish and wildlife protection, restoration, and mitigation as project purposes having equal priority with irrigation and domestic water supply uses, and fish and wildlife enhancement having an equal priority with power generation.

This document summarizes the Draft Programmatic Environmental Impact Statement (Draft PEIS) which addresses the potential impacts of implementation of the Central Valley Project Improvement Act. The PEIS was prepared pursuant to the National Environmental Policy Act (NEPA) by the U.S. Bureau of Reclamation (Reclamation) for the Department of the Interior.



Central Valley Project Water Facilities

The CVP is one of the largest water storage and conveyance systems in the world. The project includes 20 dams and reservoirs capable of storing 11 million acre-feet of water, 11 power plants, 500 miles of major canals and aqueducts, three fish hatcheries, and many other tunnels, conduits, power transmission lines, and other facilities. The CVP conveys about 20 percent of the state's developed water from the Sacramento, Trinity, American, Stanislaus, and San Joaquin rivers to agricultural and municipal water users and wildlife refuges in the Sacramento and San Joaquin valleys and the San Francisco Bay Area.

The CVP operations affect the Sacramento-San Joaquin Delta. These operations must be coordinated with the State Water Project (SWP), which also conveys water through the Delta. The SWP conveys water from the Feather River to SWP agricultural and municipal water service contractors and water rights contractors in the Sacramento and San Joaquin valleys, the San Francisco Bay Area, and the Central and Southern California Coastal areas.

The CVP and SWP are operated in accordance with their respective water rights permits and licenses administered by the State Water Resources Control Board (SWRCB). Operation of the two projects is managed through the Coordinated Operating Agreement (COA). The CVP and SWP, under their water rights permits, are required to meet water quality standards and the needs of senior water rights holders. Under the existing Biological Opinions issued under authority of the Federal Endangered Species Act, the two projects must also operate in a manner that protects the endangered winter-run chinook salmon and threatened Delta smelt.

Purpose and Need

Purpose and Need for the Federal Action

The Federal action to be taken by the Department of the Interior (Interior) is to implement the CVPIA. The general purposes of the CVPIA and the action proposed by Interior were identified by Congress in Section 3402. These purposes respond to a need to modify the existing water operations and physical facilities of the CVP.

Purpose of the Programmatic Environmental Impact Statement

The purpose of the PEIS is to evaluate the impacts of implementing the CVPIA. The PEIS addresses the CVPIA's broad, regional impact on communities, industries, economies, and natural resources. Because it is a programmatic document, the Draft PEIS presents a broad analysis, rather than presenting detailed analyses of specific projects and sites.

CVPIA Purposes (Section 3402)

a. to protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River basins of California;

b. to address impacts of the CVP on fish, wildlife, and associated habitats;

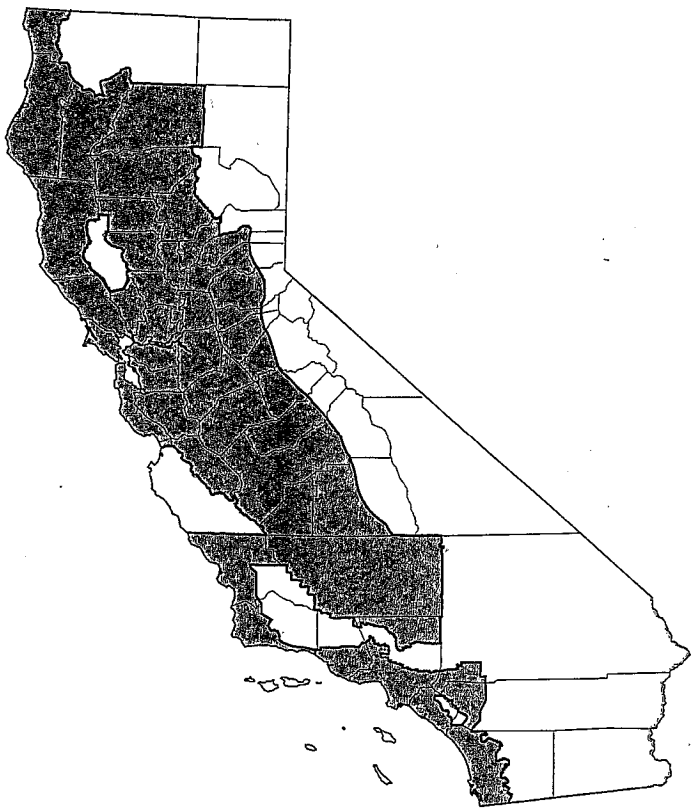
c. to improve the operational flexibility of the CVP;

d. to increase water-related benefits provided by the CVP to the State of California through expanded use of voluntary water transfers and improved water conservation;

e. to contribute to the State of California's interim and long-term efforts to protect the San Francisco Bay/Sacramento-San Joaquin Delta Estuary;

f. to achieve a reasonable balance among competing demands for use of CVP water, including the requirements of fish and wildlife, agriculture, and municipal, industrial, and power contractors.

Definition of the Study Area and Study Period



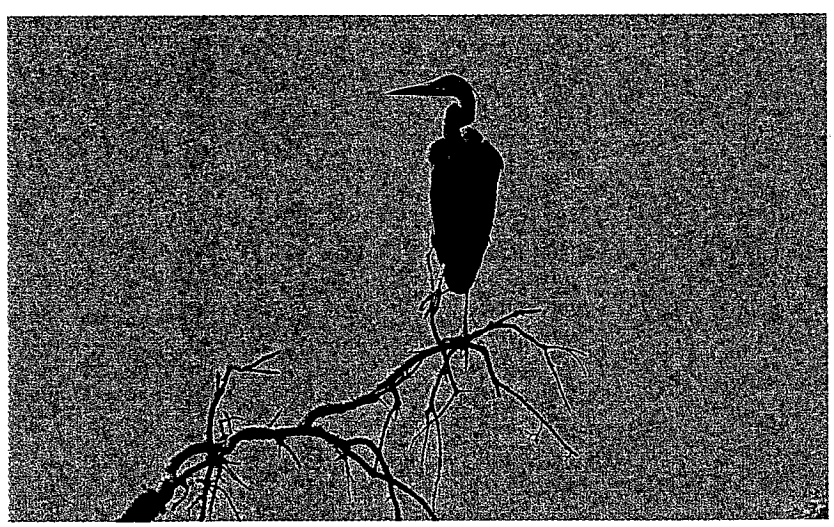
Study Area

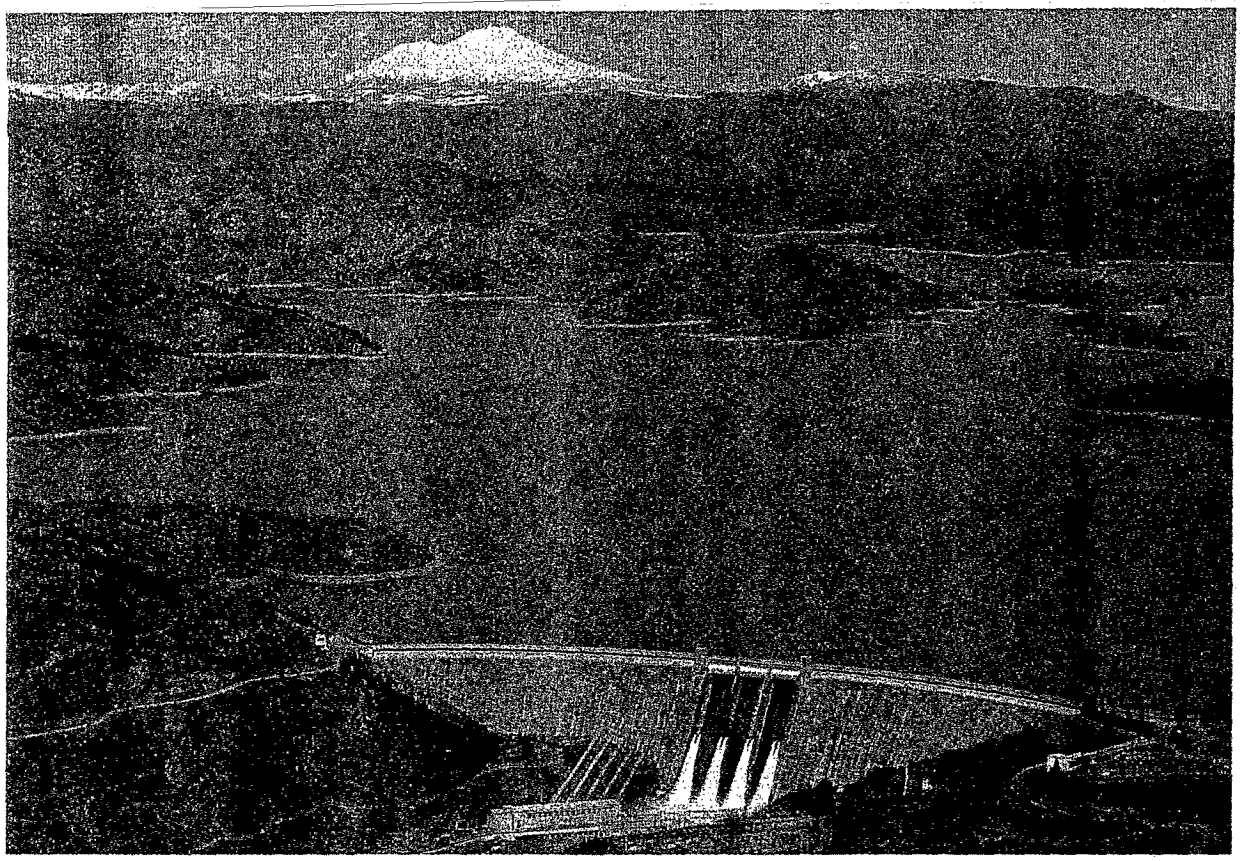
The Study Area for the Draft PEIS includes the Central Valley and coastal areas in California. The criteria for defining the Study Area were developed through a public scoping process and consisted of:

- Areas that include the CVP facilities, CVP water users, or water rights holders affected by CVP operations.
- Areas that could be directly impacted by changes in CVP operations or actions implemented under the CVPIA.
- Areas that could be directly impacted by water transfer programs which involve CVP water users or CVP facilities.

Study Period

The Draft PEIS analyzes projected conditions in the Year 2022 (30 years from the adoption of the CVPIA in October 1992).





Background

Construction of the CVP was authorized for multiple objectives including navigation, flood control, water for agricultural and municipal use, and power to support these purposes. The stage was set for major alterations of the natural flow in the Central Valley's two primary river systems and many of their tributaries.

Over the past 150 years, competition for freshwater has escalated within the tributary area of the Sacramento-San Joaquin Delta. Particularly in recent decades, population growth, with its attendant municipal and economic growth, has put increasing pressure on water resources. Agricultural and urban water demands have contributed to groundwater depletion. Wastewater discharge and contamination in runoff have affected water quality in rivers and the Delta. At the same time, agricultural and municipal development, as well as the construction and operation of water systems such as the CVP, the State Water Project, and local projects and levee systems, have sharply reduced habitat that supports fish and wildlife resources in the Central Valley.

Changes Due to Water Resource Projects

The CVP and other water projects have made the Central Valley the richest agricultural region in the nation. Low-cost water and power have also brought manufacturing, service, commerce, entertainment, and defense industries to the state, along with millions of jobs. Economic growth created increasing demand for goods and services that led to the large-scale conversion of natural habitat to agriculture and other uses.

Prior to the development of water resource projects in California, most anadromous fish migrated upstream to spawn from fall through spring. Storm flows also helped to move fish back downstream from spawning areas in the upper reaches. Runoff from rain and snow also repelled saltwater intrusion in the Delta.

Water resource projects throughout the Central Valley and foothills modified the flow patterns by shifting peak river flows to summer months, highly impacting anadromous fish species which had evolved under natural conditions. In addition, reservoirs and diversions altered the temperature of some stream reaches, blocked fish passage to some colder water stream reaches that were needed for spawning and rearing, and entrained juvenile fish in the diversions.

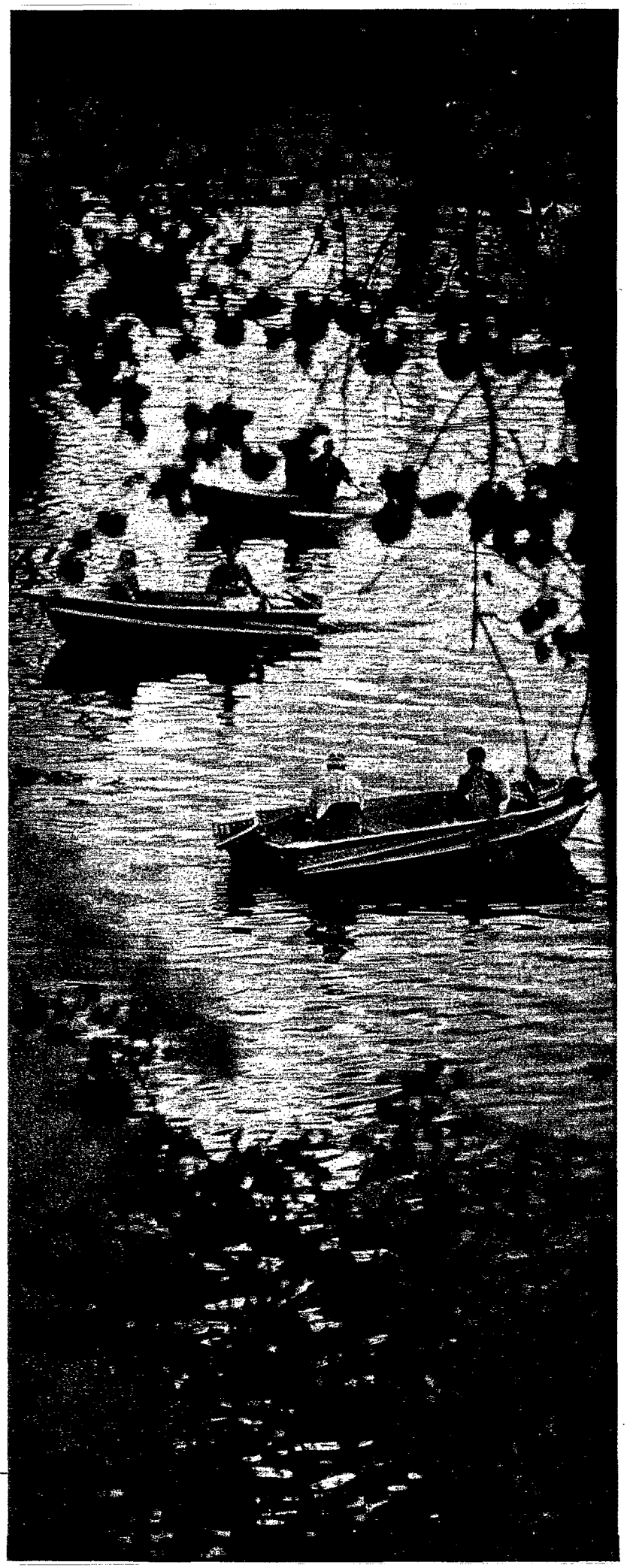
Water resource development in California has, in general, led to expansion of both the demand and supply that impact water resources and the ecosystems that are dependent on them. Through the CVPIA, Interior is developing policies that address the environmental conditions that have been affected by the CVP.

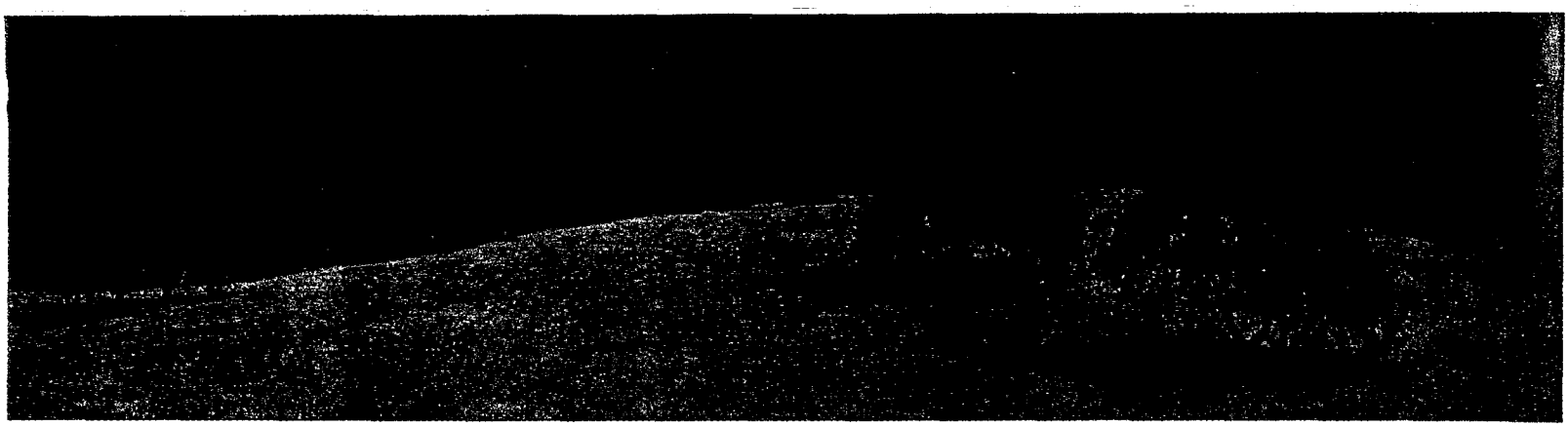
Development of the Alternatives

Alternatives considered in the Draft PEIS were developed through an extensive public scoping effort and screening process. The alternatives were developed to evaluate a range of actions, or programs, to meet CVPIA objectives and implement its provisions. The alternatives include implementation of the following programs:

- Anadromous Fish Restoration Program with flow and non-flow restoration methods and fish passage improvements;
- Trinity River Fish and Wildlife studies;
- Reliable Water Supply Program for refuges and wetlands identified in 1989 Refuge Water Supply Study and the San Joaquin Basin Action Plan;
- Protection and restoration program for native species and associated habitats;
- Land Retirement Program for willing sellers of land characterized by poor drainage; and
- CVP Water Contract Provisions for contract renewals, water pricing, water metering/monitoring, water conservation methods, and water transfers.

The alternatives were analyzed for their impacts in comparison to the No-Action Alternative.





No-Action Alternative Definition

- All Existing Facilities and Land Uses
- Shasta Temperature Control Device funded by non-CVPIA funds. Facilities under construction during Draft PEIS preparation
- Bay-Delta Plan per SWRCB Water Rights Decisions
- CVP Water Contract Renewals
- Level 2 Refuge Water Supplies from Historic Sources
- Trinity River Instream Flows of 340,000 acre-feet/year
- Increased Water Rights Demands per Department of Water Resources Bulletin 160-93
- Service/Reclamation Conservation Program
- Implement CVP Conservation Program to benefit priority and special status species

No-Action Alternative Physical Features

- All Existing Facilities
- Shasta Temperature Control Device
- State Water Project Coastal Aqueduct
- Metropolitan Water District Eastside Reservoir
- Contra Costa Water District Los Vaqueros Reservoir
- Coleman Fish Hatchery
- Stone Lakes National Wildlife Refuge
- Old River Barrier

Description of the No-Action Alternative

The No-Action Alternative reflects conditions expected to exist in the Year 2022 if the CVPIA had not been adopted and provides a basis for comparison of other alternatives. It includes existing facilities and land uses, as well as projections concerning future growth, land use changes, and changes in CVP operational policies which are being considered and have undergone separate environmental documentation. The No-Action Alternative also includes assumptions concerning concurrent but separate issues, such as the assumption that ocean harvest limitations for sport and commercial salmon fishing would be consistent with 1992 policies and will be evaluated in a separate process.

Assumptions for Physical Features Under the No-Action Alternative

Existing physical features of the CVP constitute the starting point for defining the No-Action Alternative. The No-Action Alternative also includes projects that would have been implemented without adoption of the CVPIA. The criteria for inclusion of the future facilities in the No-Action Alternative required that the project have:

- authorization and funding for design;
- final environmental documents, permits, and approvals; and
- initial authorization and funding for construction without CVPIA.

Assumptions for Operations Under the No-Action Alternative

The operational and regulatory policies and assumptions included in the No-Action Alternative were already in existence or were being developed prior to the adoption of CVPIA. The No-Action Alternative includes assumptions about results of the ongoing evaluation processes for these policies. For example, the No-Action Alternative includes assumptions for implementation of the Bay-Delta Plan Accord.

Description of Draft PEIS Programs

The CVPIA directs modifications in the operation, management, and physical features of the CVP. The Draft PEIS was structured to provide for development of a full range of implementation options while limiting them to a manageable number and for an analysis of the impacts of implementation across the various scenarios. The public process helped identify two types of implementation provisions: core programs and multiple implementation method programs.

Core programs are characterized by their single method of implementation and their applicability to all alternatives. Core programs are implemented in each alternative, and several have already been initiated.

For other programs, several implementation methods were identified, which produced different impacts at a programmatic level. The multiple implementation methods were combined into four Alternatives and 15 Supplemental Analyses. The Alternatives, which were compared to the No-Action Alternative, were based upon relatively specific assumptions for multiple implementation methods addressing CVP water system operations, CVP water pricing, and fish and wildlife habitat improvements (including water acquisition from willing sellers). The Supplemental Analyses were developed to provide additional implementation levels to meet CVPIA objectives.

Core Programs in All Alternatives

- CVP Water Contract Renewals (Section 3404(c))
- Water Measurement (Section 3405(b))
- Water Conservation (Section 3405(e))
- (b)(1) "other" Program (Section 3406(b)(1))
- Tracy and Contra Costa Pumping Plants Fish Protection Facilities Modifications (Section 3406(b)(4-5))
- Shasta Temperature Control Device Construction (Section 3406(b)(6))
- Coleman Fish Hatchery Modifications (Section 3406(b)(11))
- Clear Creek Restoration and Structural Modifications (Section 3406(b)(12))
- Non-Flow Habitat Restoration Programs on Central Valley Streams (Section 3406(b)(13))
- Anderson-Cottonwood Irrigation District Diversion Modification (Section 3406(b)(17))
- Glenn-Colusa Irrigation District Diversion Modification (Section 3406(b)(20))
- Fish Screens/Bypasses on Central Valley Streams (Section 3406(b)(21))
- Seasonal Field Flooding of up to 80,000 Acres (Section 3406(b)(22))
- Increased Minimum Trinity River Flows (Section 3406(b)(23))
- Purchase 30,000 Acres of Retired Lands from Willing Sellers (Section 3408(h))

Multiple Implementation Method Programs

Fish and Wildlife Management Programs

One of the programs considered under Multiple Implementation Methods is the Fish and Wildlife Management Program. This program includes actions to improve habitat, as defined by the Anadromous Fish Restoration Program (AFRP), and refuge water supplies. The program associated with refuge water supplies was defined in the 1989 Refuge Water Supply Study and the San Joaquin Basin Action Plan completed by the Bureau of Reclamation (Reclamation).

Anadromous Fish Restoration Program

One of the provisions of the CVPIA was to develop and implement the AFRP. The AFRP's mission is to develop reasonable efforts to double the average annual natural production of anadromous fish in the Central Valley rivers and streams by the year 2002. The AFRP is being developed to:

- obtain the best available scientific and commercial data;
- develop a long-term Restoration Plan that identifies the general approaches and actions to attain the goal; and
- develop short-term implementation plans as tiers to the Restoration Plan.

The AFRP was implemented in the Draft PEIS alternatives through the instream and Delta habitat and flow improvements. The flow improvements were developed on the basis of information developed by the U.S. Fish and Wildlife Service (Service) in October 1996. The following three tools were identified in the CVPIA to improve flows.

- **Reoperation of the CVP in accordance with Section 3406(b)(1)(B).** Reoperation is defined as changes in CVP operations that do not impact water deliveries to CVP water users.
- **Dedication of 800,000 acre-feet of CVP water in accordance with Section 3406(b)(2)** The "(b)(2) Water Management" is defined as operation of the CVP in a manner that would allow the CVP to dedicate and manage 800,000 acre-feet/year of CVP water for fish and wildlife purposes. For the Draft PEIS, this is measured as a reduction in deliveries to CVP water service contractors. The (b)(2) Water Management included an instream component for CVP-controlled streams, a Bay-Delta Plan component for the CVP, and an additional Delta component. The components are implemented differently in each alternative.
- **Water acquisitions in accordance with Section 3406(b)(3).** Water acquisitions from willing sellers would be used to provide increased instream flows in specific months to improve habitat, in accordance with preliminary information developed by AFRP. The acquisition amounts are different in each alternative.

Refuge Water Supply

Many refuges historically received water supplies from multiple sources such as irrigation return flows and temporary annual water contracts. In years preceding the CVPIA, water conservation programs and increased demand for water reduced the reliability of these sources. The CVPIA provides for a firm water supply for Central Valley wildlife refuges from existing CVP yield at the levels described in the 1989 Refuge Water Supply Study and the San Joaquin Basin Action Plan. The refuges include both National Wildlife Refuges and state-owned Wildlife Management Areas.

- All alternatives, except the No-Action Alternative, provide firm Level 2 CVP water supplies to 19 refuges. Level 2 water supply is the average historic water delivery between 1978 and 1984.
- Under Alternatives 2, 3, 4, and the associated supplemental analyses, firm Level 4 CVP water supplies are provided. Level 4 is the water supply needed to fully develop the refuges as defined in the 1989 Refuge Water Supply Study and the San Joaquin Basin Action Plan.

Water Pricing

The Draft PEIS analyzed three different methods of implementing tiered water pricing. Tiered water pricing is an incremental pricing system required by the CVPIA in which water costs rise with increased demand. Two of the options include the Ability-to-Pay policy which forgives a portion of the capital repayment obligations. The third option does not include this policy.

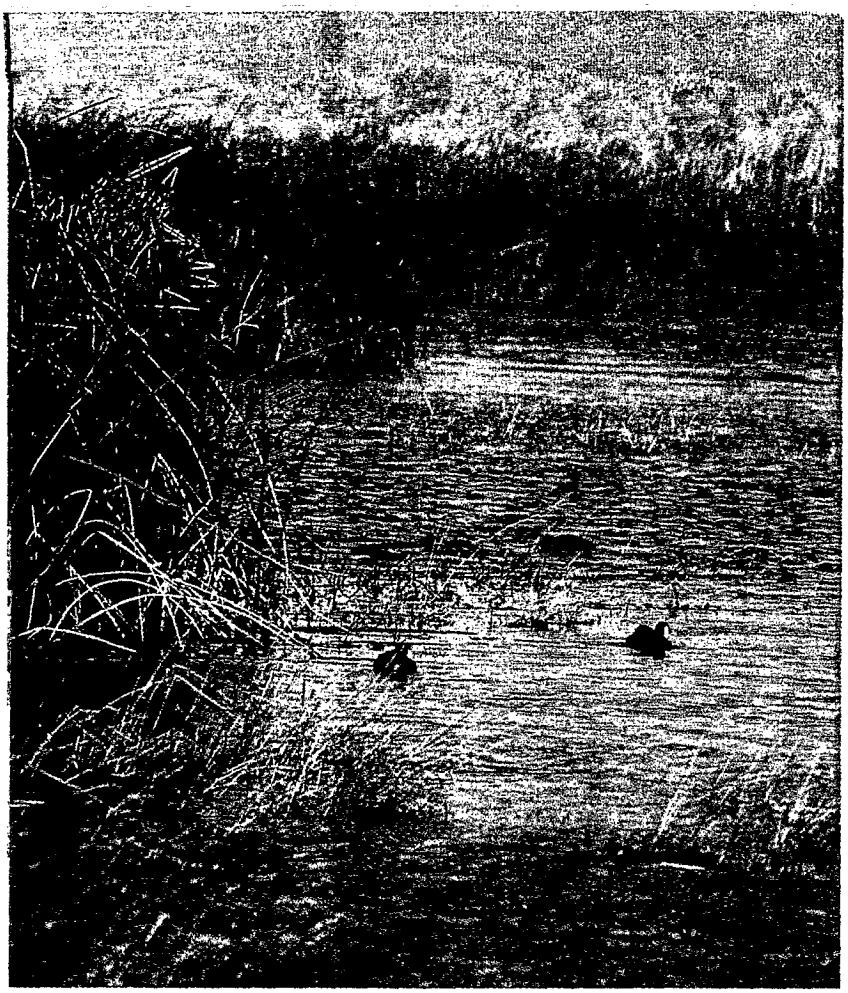
Three water pricing options were considered in the PEIS. They range from water priced at the contract rate to water priced at full cost plus 20% without the Ability-to-Pay policy applied to the option.

Water Transfer Programs

The CVPIA provides for water transfers between willing buyers and sellers, but does not mandate such transfers. The Draft PEIS analyzed the opportunities for water transfers and the way other CVPIA provisions affect these transfers.

The Transfers Program is not mandatory and, therefore, the PEIS makes assumptions about the volume of water that will be made available. The Draft PEIS bases its estimates of the volume of transferred water on the following assumptions:

- All CVP water would be transferable;
- Transfers would be limited by existing conveyance capacity and no new groundwater or recharge would be used to expand conjunctive use programs; and
- The cost of the transferred water would be equal to the capital plus operation and maintenance costs and the net income lost as a result of the transfer.



PEIS Alternatives Defined

The four main Alternatives and 15 supplemental analyses combine to make the 19 alternatives in the DPEIS. The alternatives were developed in a building block fashion to reflect various levels of implementation that may occur depending on the level of willingness to participate and partner in the CVPIA programs. The Supplemental Analyses were analyzed to determine the impacts similar actions would have on the main Alternatives. Many of the Supplemental Analyses' actions are similar, but their outcomes differ depending on the main alternative with which they are combined.

Alternative 1

This main Alternative relies primarily on the Core Programs to meet CVPIA objectives. The Core Programs, implemented in all four main Alternatives, address contract renewal, water measurement and conservation, modification of various facilities to protect fish, seasonal field flooding and land retirement, and increased flows on the Trinity River. In addition to Core Programs, Alternative 1 uses reoperation of the project to provide greater benefit to fish and wildlife. Alternative 1 uses (b)(2) water to meet the CVP share of the Bay-Delta Plan as well as (b)(2) Instream Components. Alternative 1 also implements Contract-to-Full-Cost tiered pricing rate, which begins at the contract rate for the first 80%, the average between contract and full-cost rates for the next 10% of water, and full cost for the final 10% of water.

Alternative 1 does not acquire water for instream flow improvements or make permanent structural improvements to Old River Barrier or Georgiana Slough, but it does provide Level 2 refuge supplies with a shortage provision based on the Shasta inflow index.

Alternative 1a

Supplemental Analysis 1a, as do all supplemental analyses' actions, builds on or adds to the main Alternative. Under 1a, the (b)(2) Delta Component of the AFRP joins the Bay-Delta and the Instream Components in the project reoperation and use of (b)(2) water.

Alternative 1b

This alternative adds structural improvements in the Delta to protect young salmon and other fish as they migrate through the Delta. Modified operation at the Delta Cross Channel and permanent structures at Georgiana Slough and a seasonally operated barrier at Old River will improve survivability of young fish as they migrate downstream.

Alternative 1c

All main Alternatives change current water pricing in some manner. Alternative 1c builds on Alternative 1 by implementing the tiered pricing requirement of the CVPIA through the Full-Cost-Plus method. The first 80% of contract allocation is priced at full cost, the next 10% of allocation is 110% of full cost, and the final 10% of allocation is 120% of full cost.

Alternative 1d

Supplemental Analysis 1d builds on the refuge water supply element of Alternative 1 by eliminating the shortage provision. In 1d, Refuges will receive full Level 2 supply in all years.

Alternative 1e

Water transfers are between willing seller and buyer and, therefore, are not mandated by the CVPIA. Supplemental Analysis 1e integrates the expected benefits of transfers to the main Alternative with fees specified by the CVPIA and allows transfer of CVP water to non-CVP users.

Alternative 1f

This alternative is similar to 1e in its purpose, but would add a $50/acre-feet (AF) fee on all CVP transfers, with the additional funds added to the Restoration Fund. This alternative and others that impose the additional fee would require additional Congressional authorization.

Alternative 1g

Supplemental Analysis 1g removes the current ability-to-pay policy applied to the 80/10/10 Contract-to-Full-Cost tiered pricing policy implemented in the main Alternative 1.

Alternative 1h

Restoration Funds would be used under this alternative to develop and implement a formal Revegetation Program for the retired lands. This alternative increases the use of the Restoration Funds for habitat restoration and enhancement.

Alternative 1i

Supplemental Analysis 1i provides year-round opening of the Red Bluff Diversion Dam gates. This alternative will improve operational flexibility and provide greater balance among water supply and fish and wildlife demands. Diversions to the Tehama-Colusa Canal do not change from previous alternatives.

Alternative 2

Alternative 2 builds on Alternative 1 by acquiring, from willing sellers, 60,000 AF of water on both the Stanislaus and Tuolumne rivers, 50,000 AF on the Merced River, and an undetermined amount on Upper Sacramento River Tributaries. Refuge water supplies are increased to Level 4, subject to hydrologic shortages, through water purchase from willing sellers.

The acquired water will be used to improve fishery conditions on rivers tributary to the Delta. In addition to assisting in meeting target flows for the streams, the water would also be used to increase flows through the Delta and would not be exported.

Alternative 2a

Supplemental Analysis 2a, like alternative 1b, would add structural improvements in the Delta to protect young salmon and other fish as they migrate through the Delta.

Alternative 2b

This alternative allows transfers from CVP to non-CVP water users and includes fees specified in the CVPIA, similar to Supplemental Analysis 1e, but builds on Alternative 2.

Alternative 2c

Supplemental Analysis 2c is similar to 1f, which adds a $50/AF fee to all transfers of CVP water. Like 2b, however, alternative 2c is additive to the main Alternative 2.

Alternative 2d

Supplemental Analysis 2d is similar to alternative 1c as it implements the tiered pricing requirement of the CVPIA through the Full-Cost-Plus method, but builds on alternative 2.

Alternative 3

Alternative 3 continues to build on the previous main Alternatives by retaining all of Alternative 1 and the Refuge Water Supply provision of Alternative 2 and adds to the volume and number of streams on which water is acquired.

Alternative 3 will acquire 200,000 AF on each of the Stanislaus, Tuolumne, and Merced rivers; 30,000 AF on the Calaveras River; 70,000 AF on the Mokelumne River; and 100,000 AF on the Yuba River. An undetermined amount of water will also be acquired on Upper Sacramento River Tributaries.

Alternative 3 is further distinguished from Alternative 2 in that acquired water is not specifically used to increase in-Delta Flows. As a result, acquired water is available for export under Alternative 3 once requirements of the Bay-Delta Plan have been met.

Alternative 3a

This alternative repeats the water transfer implementation, as in alternatives 1e and 2b, which includes only fees specifically mandated by the CVPIA.

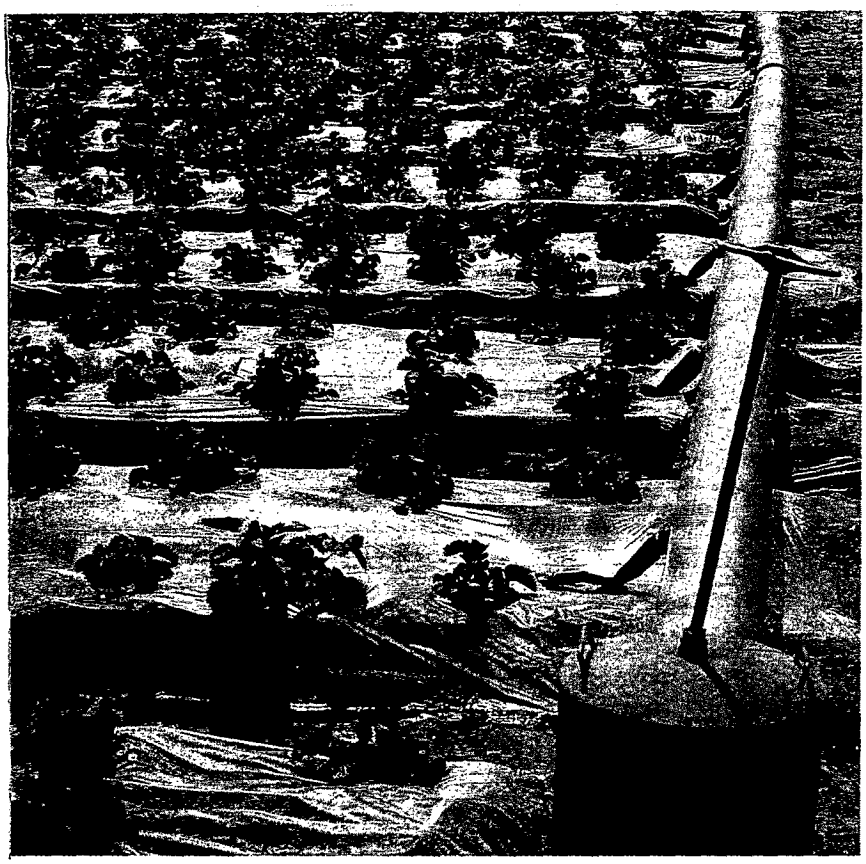
Alternative 4

Alternative 4 builds from Alternative 3 by adding the Delta Component of the AFRP to the reoperation and (b)(2) water program and using the acquired water for Delta flow increases. Acquired water is not available for export from the Delta.

This Alternative completes the upper range of water acquisition and instream use. It provides the same acquisition levels in all streams as Alternative 3 and provides no export of acquired water as in Alternative 2.

Alternative 4a

This alternative repeats the water transfer implementation as in alternatives 1e, 2b, and 3a, which includes only fees specifically mandated by the CVPIA.



Summary of Impact Assessment

The alternatives were analyzed to determine the potential for adverse and beneficial impacts associated with implementation of the alternatives. Most impacts under the alternatives, as compared to the No-Action Alternative, are related to changes in water facilities operations and deliveries, groundwater, power resources, fishery resources, vegetation and wildlife, agricultural land use and economics, regional economics, recreational opportunities, social conditions, and cultural resources. Changes to other resource areas could not be defined at the programmatic level.

Changes in Water Facilities Operations and Deliveries

Changes to CVP operations are similar in all alternatives and were primarily related to 1) reduced diversions from the Trinity River Basin to the Sacramento River; 2) increased releases from Shasta Lake in fall, spring, and summer to meet target flows and to meet requirements in the Sacramento River that had been partially met by water from the Trinity River Basin; 3) increased flows on Clear Creek in non-critically dry years; 4) reduction in summer releases from Folsom Lake to increase storage in September and to stabilize flows from October through February in the American River; and 5) increased instream flows in the Stanislaus River during non-critically dry years.

Primarily as a result of decreased Trinity River Basin diversions to the Sacramento River and (b)(2) Water Management, average annual CVP exports in the Delta decrease. The CVP operations in the Delta are similar in Alternatives 1 and 2 and Supplemental Analyses 1b through 1i and 2a through 2c. Under Alternative 3 and Supplemental Analysis 3a, acquired water could be exported and, therefore, the annual exports by both the CVP and SWP increase as compared to other alternatives. Under Alternative 4 and Supplemental Analyses 1a and 4a, Delta exports are reduced as compared to the other alternatives due to the implementation of (b)(2) Water Management in the Delta in addition to the Bay-Delta Plan and use of acquired water in the streams and in the Delta for Alternatives 4 and 4a.

The alternatives have varying effects on CVP water deliveries. Water deliveries to CVP water service contractors are less in each of the alternatives as compared to the No-Action Alternative. Water deliveries to the water rights contractors and exchange contractors do not change between the No-Action Alternative and the other alternatives. CVP water operations could vary significantly under Supplemental Analyses 1c and 2d as compared to the other alternatives. Under these alternatives, CVP water service contract demands are reduced by 570,000 acre-feet/year due to the high price of CVP water under the alternatives. The water could be reallocated to other CVP contractors, used to meet other fish and wildlife needs, or transferred by the CVP contractors with reduced demands. If this water is used by other CVP contractors or transferred, CVP operations may not change noticeably. If the water is used for fish and wildlife needs, reservoir storage and stream flows may change significantly.

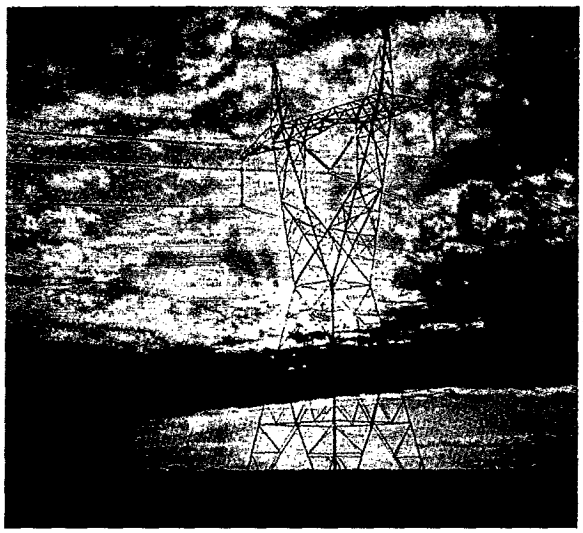
Several alternatives call for water acquisitions to increase instream flows in the river where the water is acquired and also in downstream rivers and in the Delta. For the water acquisition actions under Alternatives 2, 3, and 4 and Supplemental Analyses 2a through 2d, 3a, and 4a, water generally would either be released in the spring or stored for release in the fall.

Changes in Groundwater Resources

Impacts on groundwater result from changes in surface and groundwater use, crop mix and irrigation technology, and stream flows.

In Alternative 1, the average change in groundwater depth would increase between 0% and 3% in Sacramento, San Joaquin, and the northern Tulare Lake regions. Depth would decrease 1% in the southern Tulare Lake region. In

Alternative 2, groundwater depth would increase between 1% and 4% in the same regions with a similar decrease in the southern Tulare Lake region. Groundwater depths would be greater, between 1% and 5%, in the Sacramento region. The San Joaquin region would increase depth by 4% in Alternative 3. Tulare Lake would also have a 1% depth increase in the north and a depth decrease of 3% in the south. All regions would have a depth increase between 1% and 5% in Alternative 4.



Changes in Power Resources

Changes in CVP operations, especially increased releases for instream fish flows in the Trinity River Basin, shift patterns of CVP power generation. Under all alternatives, generation shifts from summer months to the spring and fall months when the demand for hydropower is less. Overall, generation is reduced approximately 5%. The cost of replacement power to meet summer month loads may increase the overall cost of power supplies to CVP preference power customers. Under all alternatives, CVP loads are reduced approximately 10% except in Alternative 3 and Supplemental Analysis 3a. Because exports increase in Alternative 3 and Supplemental Analysis 3a, project use decreases only 4% from the No-Action Alternative.

Changes in Fishery Resources

Conditions for fish in CVP-controlled rivers and the Delta generally improve under all alternatives and supplemental analyses as a result of increased flows and non-flow actions such as fish screen and fish passage improvements, habitat restoration, improved water quality, and predator control.

Under Alternative 1 and Supplemental Analyses 1a through 1i, flows for fish are increased on CVP-controlled rivers, and reservoirs are reoperated to reduce short-term flow fluctuations. These actions generally improve environmental conditions although adverse effects occur on some streams for some species. Supplemental Analyses 1a and 1b improve fishery conditions in the Delta as compared to Alternative 1 due to increased Delta inflows, reduced pumping, and additional fish protection.

Alternative 2 and Supplemental Analyses 2a through 2d include all the benefits of Alternative 1 and improve conditions in the Stanislaus, Tuolumne, Merced, and the lower San Joaquin Rivers and in the Delta with respect to temperatures, improved habitat, reduced losses to diversions, improved fish movement, and improved food web support. Additional fish protection under Supplemental Analysis 2a would further improve fishery conditions in the Delta.

Alternative 3 and Supplemental Analysis 3a include all benefits of Alternative 2 and further improve conditions on the Yuba, Mokelumne, Calaveras, Stanislaus, Tuolumne, and Merced Rivers and in the Delta.

Alternative 4 and Supplemental Analysis 4a include all the benefits of Alternative 3 and add improvements to passage, diversions, and flow in the Delta.

Changes in Vegetation and Wildlife

Under Alternative 1 and Supplemental Analyses 1a through 1i, land fallowing and retirement benefit special-status and other wildlife species in the San Joaquin River and Tulare Lake regions. Restoration of a meander belt on the upper Sacramento River benefits riparian habitat in the area; riparian restoration on other rivers in the Sacramento River and San Joaquin River regions has locally beneficial effects on the extent and condition of riparian habitat. Level 2 refuge water supplies increase wetland habitat available to waterfowl and waterbirds. Flooding of up to 80,000 acres of agricultural habitat during winter offers major benefits to migratory waterfowl, shorebirds, and wading birds, including special-status species. Implementation of the b(1) "other" program benefits species not specifically identified in the CVPIA through habitat restoration, maintenance, enhancement, and protection.

Impacts of Alternative 2 and Supplemental Analyses 2a through 2d are similar to those of Alternative 1; in addition, higher spring flows on the Stanislaus, Tuolumne, and Merced rivers increase water levels in the San Joaquin River at Vernalis, and benefit riparian habitat. Level 4 refuge water supplies allow optimal management of refuges.

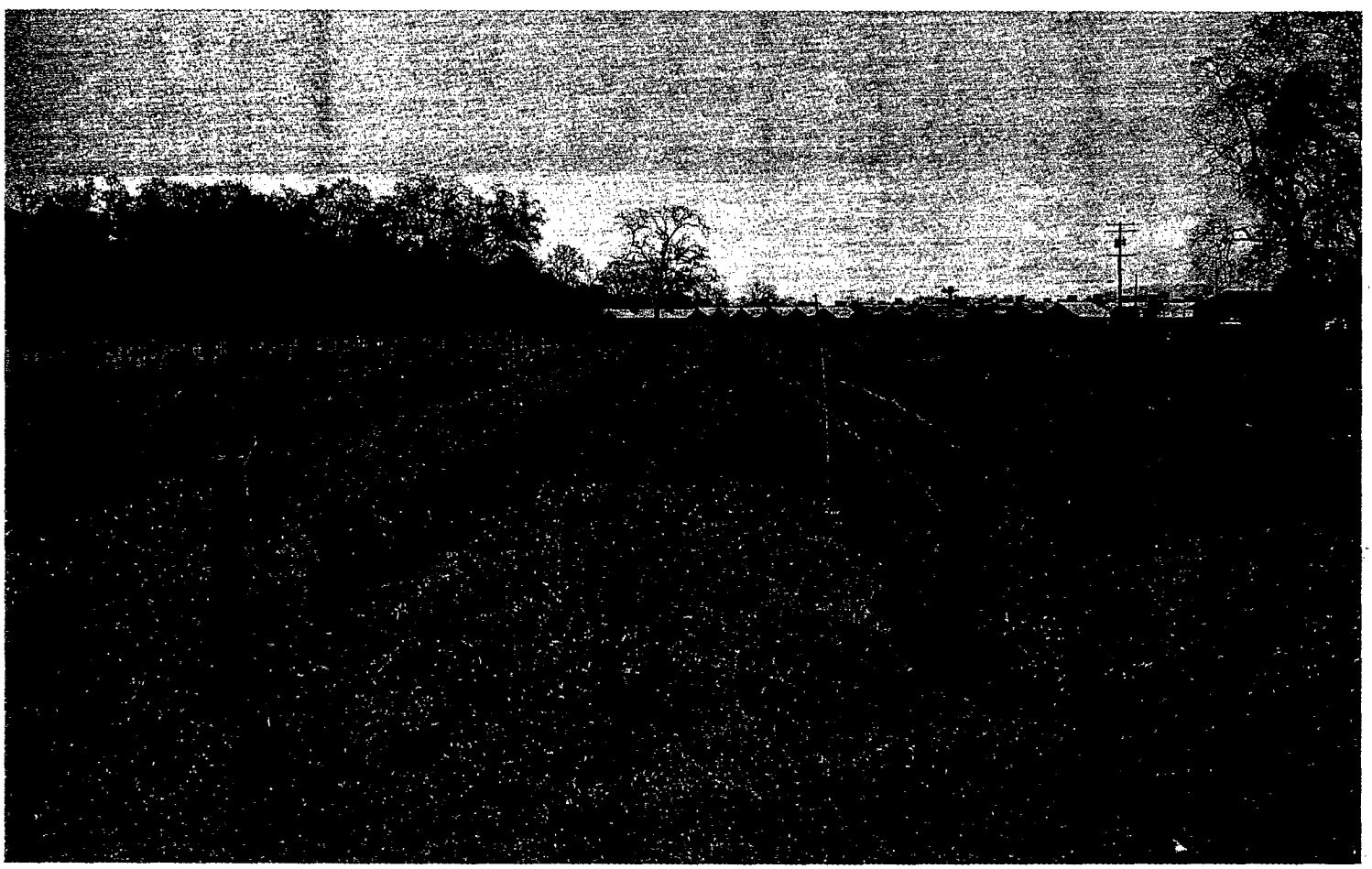
Impacts of Alternatives 3 and 4 and Supplemental Analyses 3a and 4a are similar to those of Alternative 2, plus additional agricultural land is fallowed and conservation easements may be acquired on a portion of the land. Further, increased flows in the Stanislaus, Tuolumne, and Merced rivers lead to greater improvements in riparian vegetation on the San Joaquin River near Vernalis.

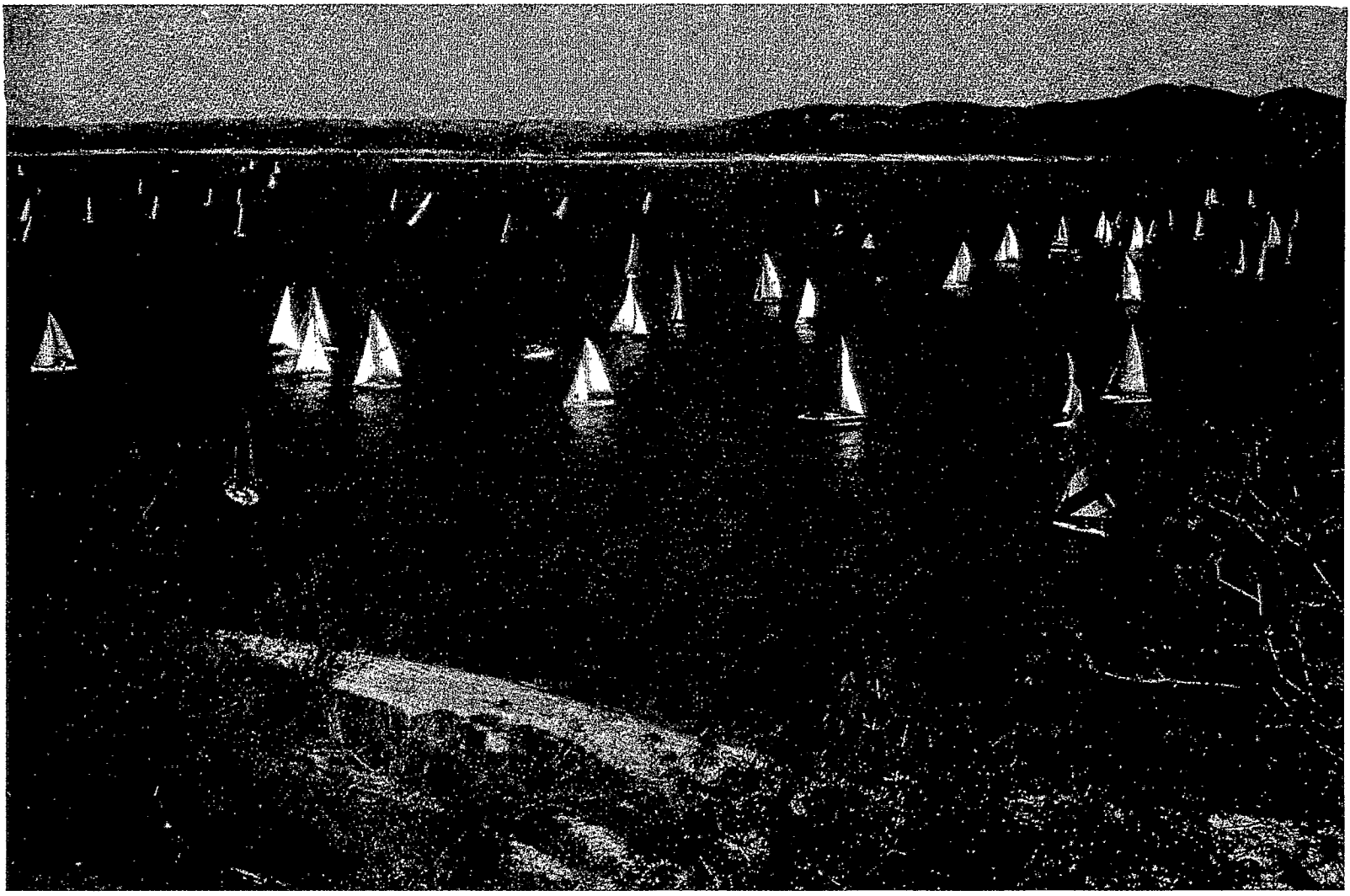
Changes in Agricultural Land Use and Economics

In all alternatives, the total percentage change in irrigated acreage would be greatest in the San Joaquin River region which includes the land retirement program. Land retirement actions would also reduce irrigated acreage in the Tulare Lake region.

The provisions that would potentially affect agricultural land use and economics include (b)(2) water management for fish and wildlife, water acquired for stream flows and refuges, water pricing, restoration payments, water conservation and measurement, land retirement, and water transfers.

Throughout the Central Valley, a reduction of 1% or 48,000 acres and about $46 million in gross revenue reduction would be expected under Alternative 1. The reduction under Alternative 4 are expected to be about 3% of total irrigated acreage or 191,000 acres for the Central Valley. Similarly, gross revenues would also decline $117 million in an average water year under Alternative 4.



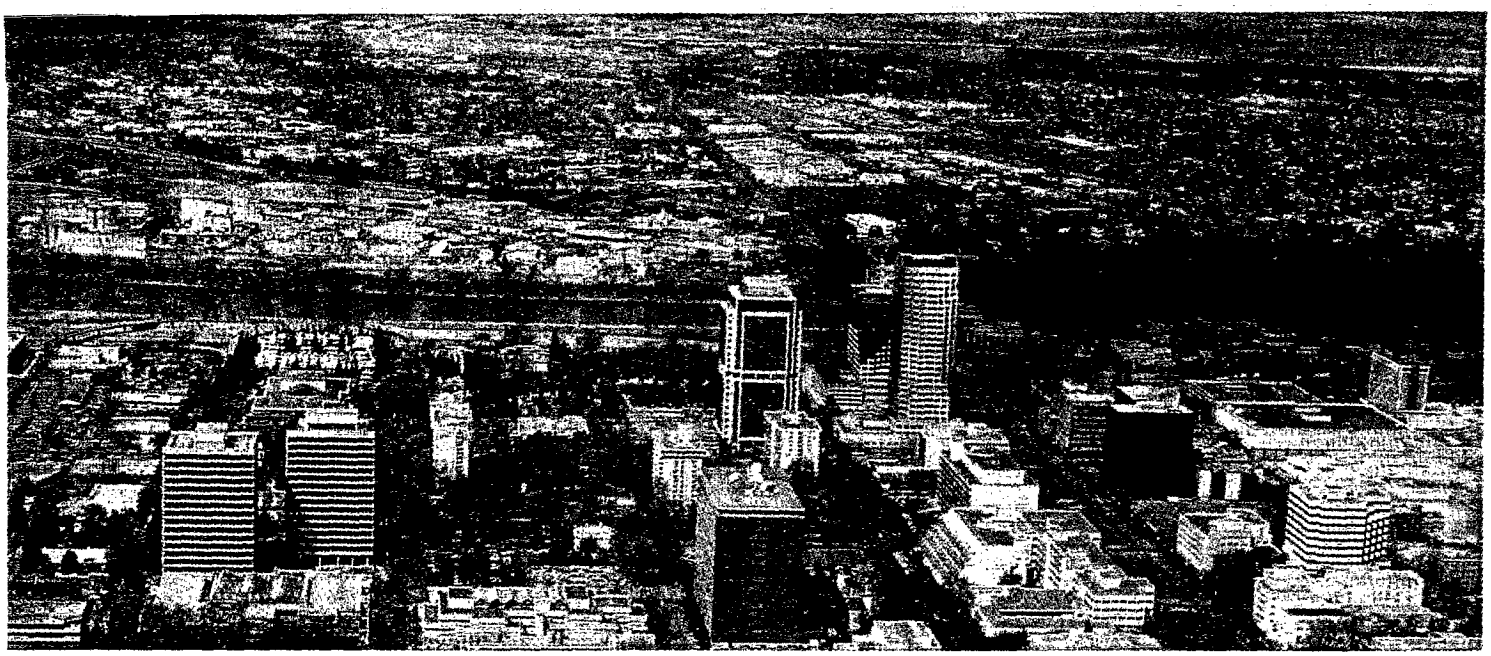


Changes in Recreational Opportunities

Recreational opportunities under the No-Action Alternative are about $145 million per year in recreation-related expenditures at major reservoirs and refuges in the Sacramento River region and about $85 million per year in the San Joaquin River and Tulare Lake regions combined.

Under all alternatives, recreational use at major reservoirs changed less than 1 percent although recreational use of refuges increased significantly. Recreational use of refuges increased over 25% under Alternative 1 and Supplemental Analyses 1a through 1i and over 60% in all other alternatives, as compared with the No-Action Alternative. Expenditures for recreation increased by less than 1% in Alternative 1 and its supplemental analyses, but increased by 2-3% under all other alternatives when compared to the No-Action Alternative.

Flatwater recreational opportunities would be eliminated at Lake Red Bluff under Supplemental Analysis 1i. This reduction in opportunities would reduce recreational expenditures during the summer and especially during the Memorial Day weekend.



Changes to Regional Economics and Social Conditions

Implementation of all alternatives resulted in job losses in all regions of the Central Valley and the San Francisco Bay Area. For the Sacramento region under Alternative 1, losses ranged from under 200 jobs up to 1000 jobs under Alternatives 3 and 4. For the San Joaquin region, Alternative 1 will result in a loss of 2,500 jobs, and up to 4,000 jobs under Alternative 4. Tulare Lake region will experience job losses of 800 in Alternative 3 and 1,100 in Alternative 4. Under all Alternatives, about 100 job losses will occur in the San Francisco Bay region.

In the Central and South Coast, about 200 jobs were lost under Alternative 4; however, job gains ranged from 1,000 in Alternative 1 to 3,100 in Alternative 3. Additional job losses occurred in areas of willing sellers for transferred water under Supplemental Analyses 1e, 1f, 2b, 2c, 3a, and 4a. The loss of jobs is partially offset by a slight increase in economic activity due to increased revenues from water sales.

The job losses may not be significant if distributed uniformly over an entire region, such as the Sacramento River region. However, if all job losses occur in one community, the impact could be severe and may affect even more households.

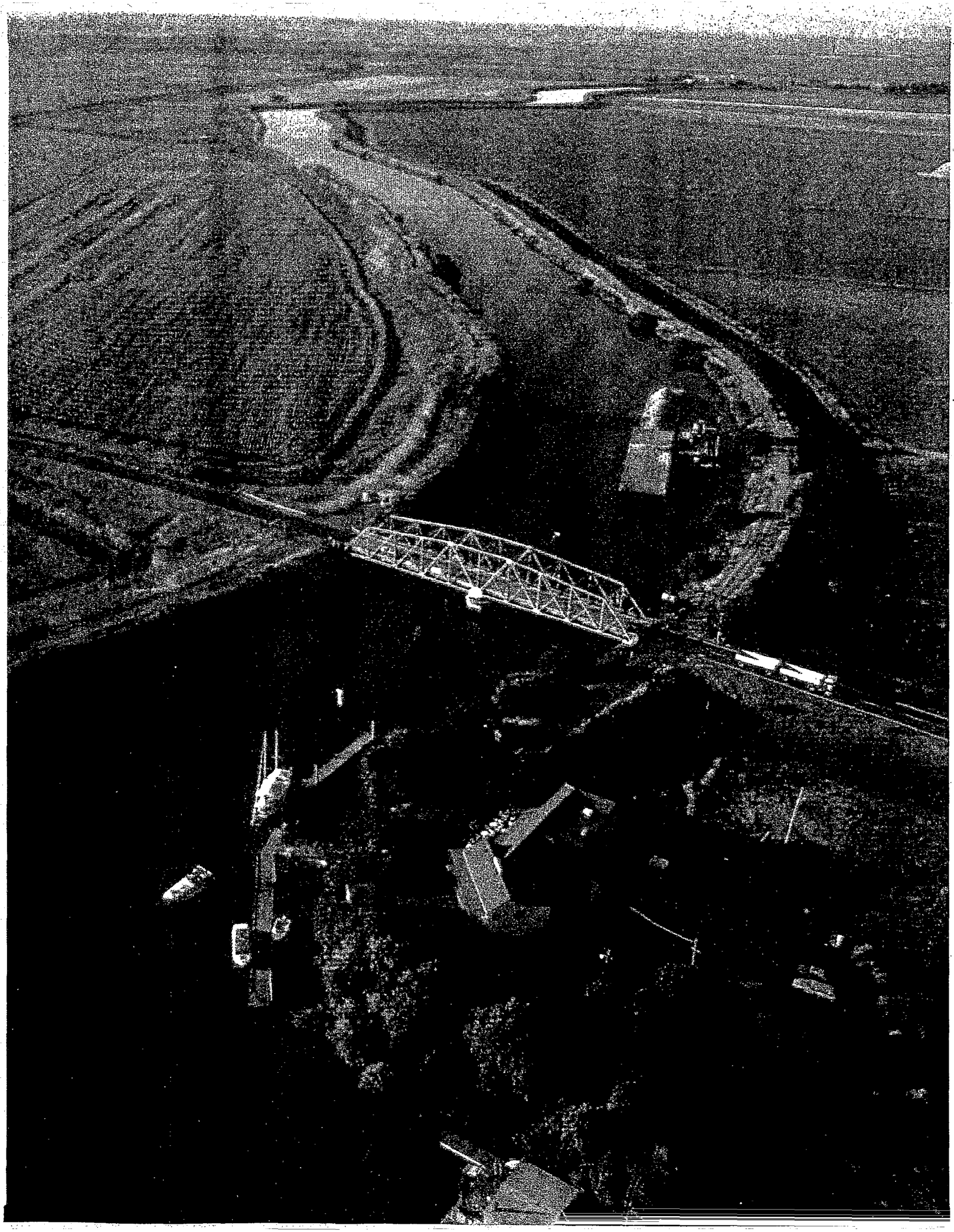
Cultural Resources

Under some alternatives, cultural resources may be affected; however, those impacts could not be quantified in the programmatic level assessment. As project-specific documentation is undertaken, those impacts can be properly assessed and mitigation measures proposed.

Prior to implementation of actions, Interior will comply with Section 106 of the National Historic Preservation Act to account for the effects on historic properties. Interior will develop mitigation measures pursuant to Section 106 and will consult with the Advisory Council and State Historic Preservation Office.

Environmental Justice and Indian Trust Assets

Executive Order 12898 requires that federal agencies analyze the impacts of alternatives to evaluate disproportionate impacts to minorities and low income populations. The impacts of the alternatives occur throughout the Central Valley; therefore, it is difficult to conclude that one social group would be adversely affected to a greater extent by any of the alternatives. The impacts reflect the type of labor requirements required for agricultural production and skill and education level. There could be adverse impacts to farm laborers who may be economically disadvantaged, lack English language skills, and/or lack education or training to obtain other employment. Many of the farm laborers in the Central Valley are members of minority groups; however, it is not the intent of CVPIA to affect these groups. Quantitative impacts cannot be determined at this time because the location of land that will become non-irrigated is not known. If affected land is located throughout the Central Valley, one group may or may not be affected to a greater extent. Reclamation policy is to protect American Indian Trust Assets and to determine if alternatives would affect the use and enjoyment of trust assets. None of the alternatives would adversely affect reserved water rights, water quality of the water rights, hunting and fishing rights, or noise near a land asset. Increased stream flows associated with the alternatives could positively affect Indian Trust Assets located adjacent to rivers and the associated hunting and fishing rights.



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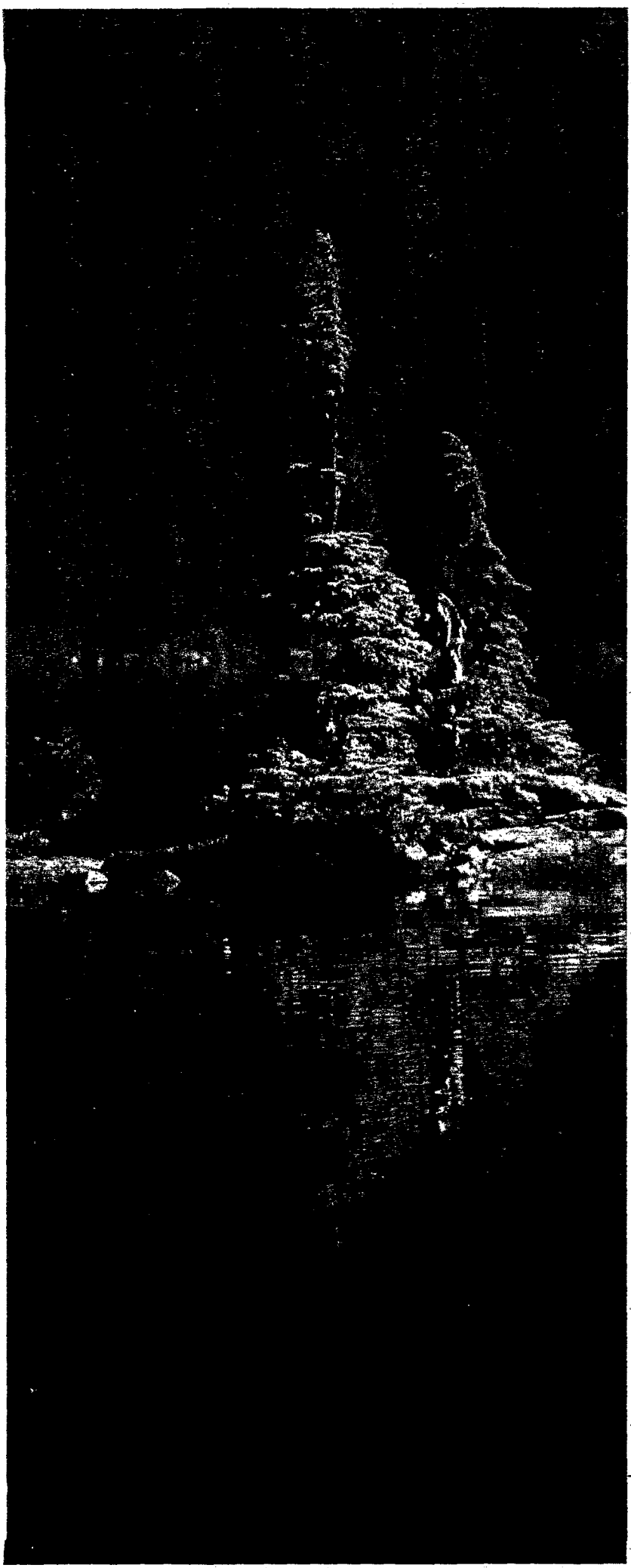


Selection of Preferred Alternative

The Draft PEIS does not include a Preferred Alternative. It is anticipated that the Preferred Alternative in the Final PEIS will be composed from the range of actions that are evaluated in the Draft PEIS alternatives.

The Draft PEIS alternatives include many separate actions that could be combined into hundreds of permutations. For the Draft PEIS, these actions were combined into alternatives to provide the decision maker with information of how different factors would be affected by changes in fish and wildlife habitat actions, water facilities operations, and water pricing and contract provisions. The alternatives were evaluated in this manner to provide "bookends" to the analysis and to identify a wide range of impacts that could occur for the different boundary conditions. Therefore, the decision maker could select the boundary conditions for the Proposed Action from the array of different alternatives evaluated in the Draft PEIS.

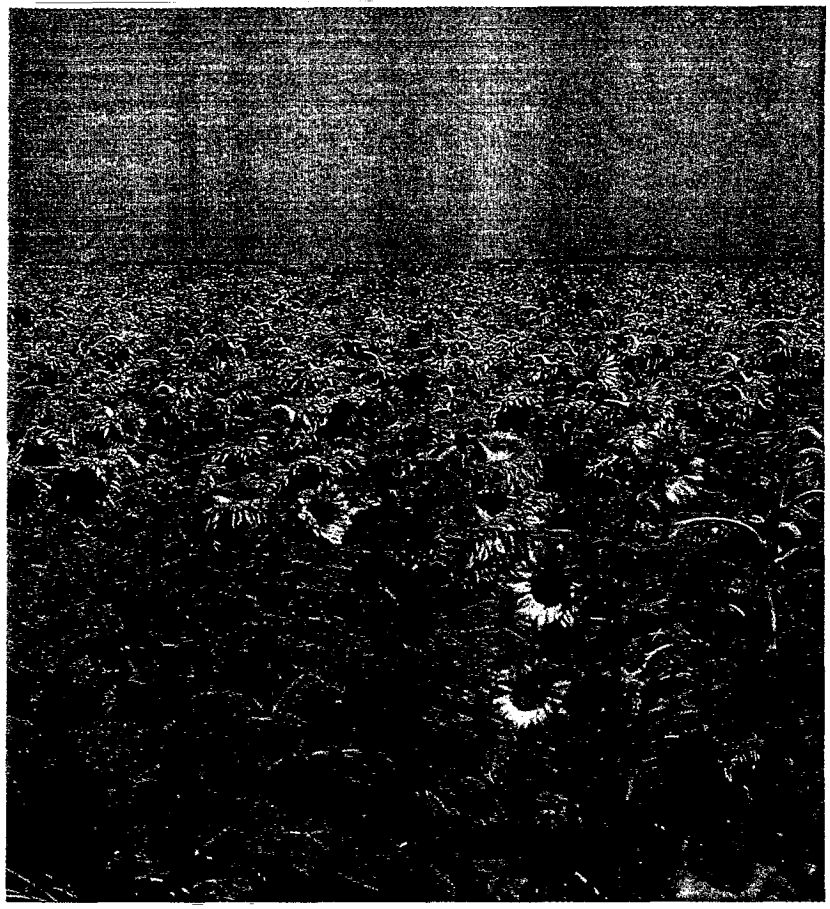
Public Involvement

Public and stakeholder involvement was crucial in creating an open and inclusive process to develop the CVPIA implementation program. Throughout the preparation of the Draft PEIS, meetings were held with the Cooperating and Consulting Agencies, other agencies, interest groups, and the public.

Preparation of the Draft PEIS began during the Scoping phase. Scoping served as a fact-finding process that helped identify public concerns and recommendations about the CVPIA, the Draft PEIS process, issues that would be addressed in the Draft PEIS, and the scope and level of detail for the analyses. Scoping activities formally began in January 1993 after a Notice of Intent to prepare the Draft PEIS was filed in the Federal Register and formally ended in April 1993 with the release of the Scoping Report and the Public Involvement Plan. Public participation continued, however, on an informal basis to ensure that new issues and concerns were considered throughout the Draft PEIS process.

Meetings were held at least four times a year and occurred more frequently during the development of the alternatives and identification of the Purpose and Need for the Project. Between meetings, a newsletter was distributed to interested individuals about the progress and development of the Draft PEIS.

Issues raised during the public involvement process included geographic scope of the Draft PEIS, level of detail, analytical tools used in impact assessments, definition of the No-Action Alternative and other alternatives, redefinition of the alternatives, and expected impacts.



Agencies that Participated in Draft PEIS Preparation

Cooperating Agencies that Participated in Draft PEIS Preparation

- California Department of Fish and Game
- California Department of Water Resources
- California State Water Resources Control Board
- Hoopa Valley Tribe
- U.S. Army Corps of Engineers
- U.S. Environmental Protection Agency
- U.S. Fish and Wildlife Service
- National Marine Fisheries Service
- Western Area Power Administration

Consulting Agencies That Participated in Draft PEIS Preparation

- U.S. Geological Survey
- U.S. Natural Resources Conservation Service
- U.S. Bureau of Indian Affairs

Opportunities For Public Involvement

Public involvement continues to be important to the preparation of the Programmatic Environmental Impact Statement (PEIS) and implementation of the Central Valley Project Improvement Act.

With release of the Draft PEIS, the formal comment period begins. The public is encouraged to submit written comments and attend the public hearings on the draft. Contact Reclamation for a schedule. All written and oral comments received during the review will be addressed in the final PEIS.

Federal, state, and local agencies have received the Draft PEIS, as have interested groups and individuals. The Draft PEIS also is available for review at selected libraries in the Study Area.

Contact Persons

For more information or to obtain a copy the Draft PEIS, contact:

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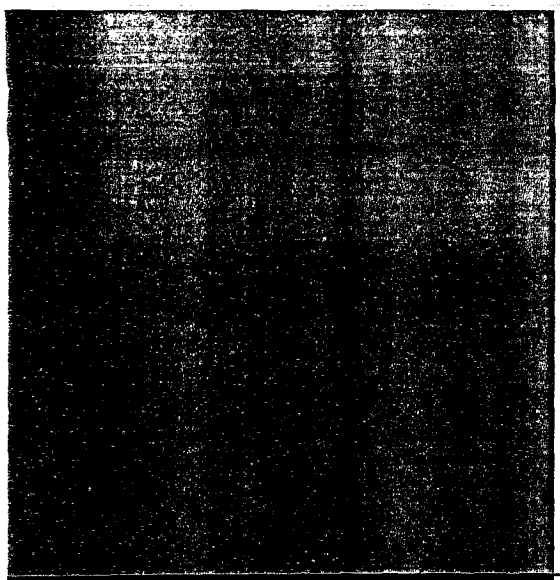

Mission Statement

U.S. Department of the Interior

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering wise use of our land and water resources; protecting our fish, wildlife, and biological diversity; preserving the environmental and cultural values of our national parks and historical places; and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to ensure that their development is in the best interests of all our people by encouraging stewardship and citizen participation in their care. The Department also has a major responsibility for American Indian reservation communities and for people who live in island territories under U.S. administration.

Bureau of Reclamation

The mission of the Bureau of Reclamation is to manage, develop, and protect water and related resources in an environmentally and economically sound manner in the interest of the American public.

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